Towards Interoperable Preservation Repositories

TIPR

US Digital Preservation Interoperability Framework Workshop

2010-03-31

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Presentation Overview

- Motivation & Target Audience
- Other Approaches
- TIPR Approach
- TIPR Partners: Heterogeneous Repositories & AIPs
- Repository Exchange Package (RXP)
- Testing, Issues, & Lessons Learned to Date
- Future Plans
- Questions

Motivation & Target Audience

- **Motivation:**
  - Facilitate AIP exchange between heterogeneous preservation repositories
  - AIP exchange important for:
    - redundancy
    - software migration
    - succession planning
- **Target Audience:**
  - those interested in exchanging AIPs between heterogeneous preservation repositories

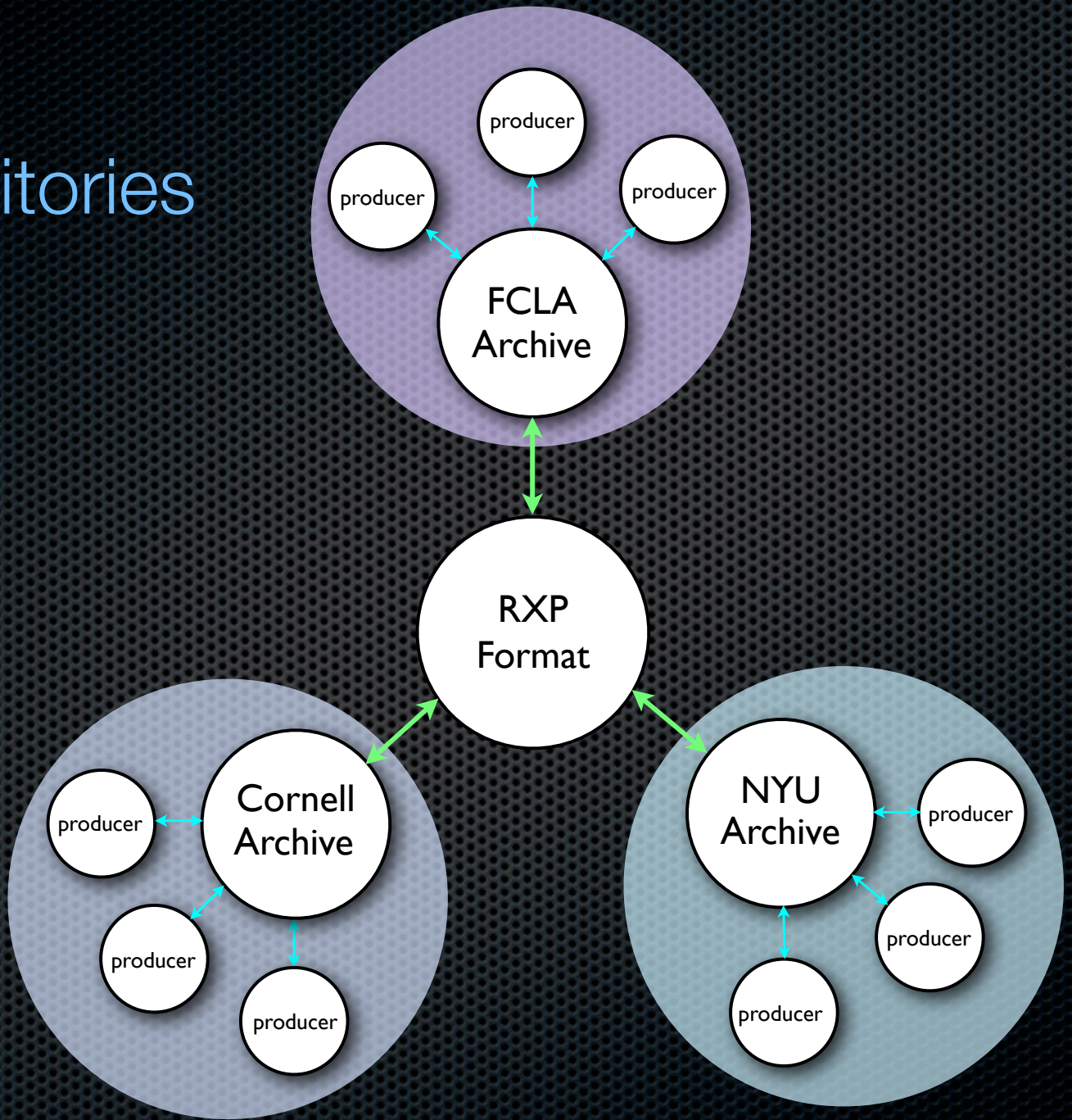
Other Approaches

- Other Approaches to AIP exchange between heterogeneous repositories
  - NDIIPP ECHO DEPository Hub and Spoke (HandS)
    - R&D at University of Illinois at Urbana-Champaign
    - Hub adds preservation metadata during exchange
    - http://www.ndiipp.illinois.edu/
  - Open Archives Initiative's Object Reuse and Exchange (OAI-ORE)
    - Fedora/EPrints demonstration project by Tarrant, et. al.
    - Not formally about AIP exchange, but may be applicable in preservation context
    - http://journal.code4lib.org/articles/1062

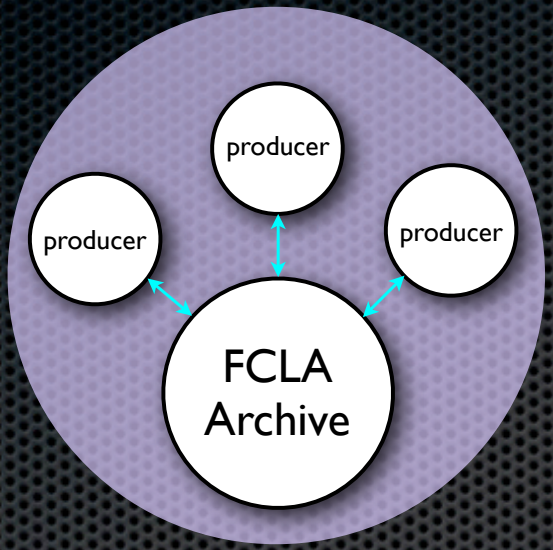
TIPR Approach

- Define a common exchange package format: the Repository Exchange Package (RXP)
- No reliance on transport protocol
- RXP accommodates heterogeneous AIP structures and heterogeneous repository implementations
- Exchanging Repositories can Ingest and Disseminate RXPs
- Interchanging repositories agree on exchange parameters
- Peer-to-peer repository exchanges

TIPR Repositories



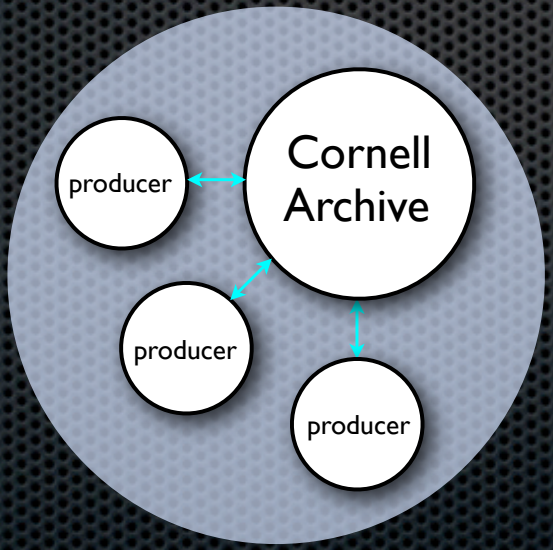
TIPR Repositories FCLA



- Florida Center for Library Automation (**FCLA**)
  - runs the **DAITSS** Preservation Repository
  - **Team**: Priscilla Caplan (PI), Franco Lazzarino, Marly Wilson, Randy Fischer

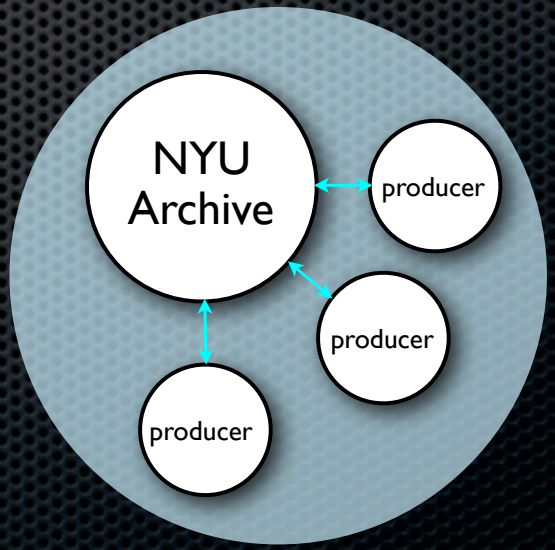
TIPR Repositories CUL

- Cornell University Libraries (**CUL**)
  - runs an **aDORe**-based repository
  - migrating to **Fedora**
  - **Team**: Oya Rieger, Bill Kehoe, Rick Silterra, Adam Smith

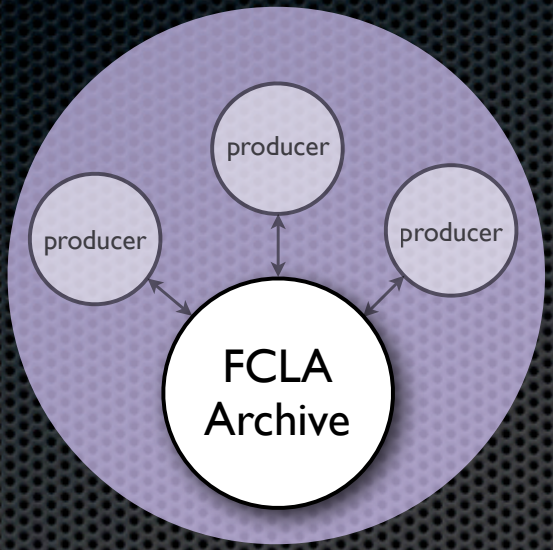


TIPR Repositories NYU

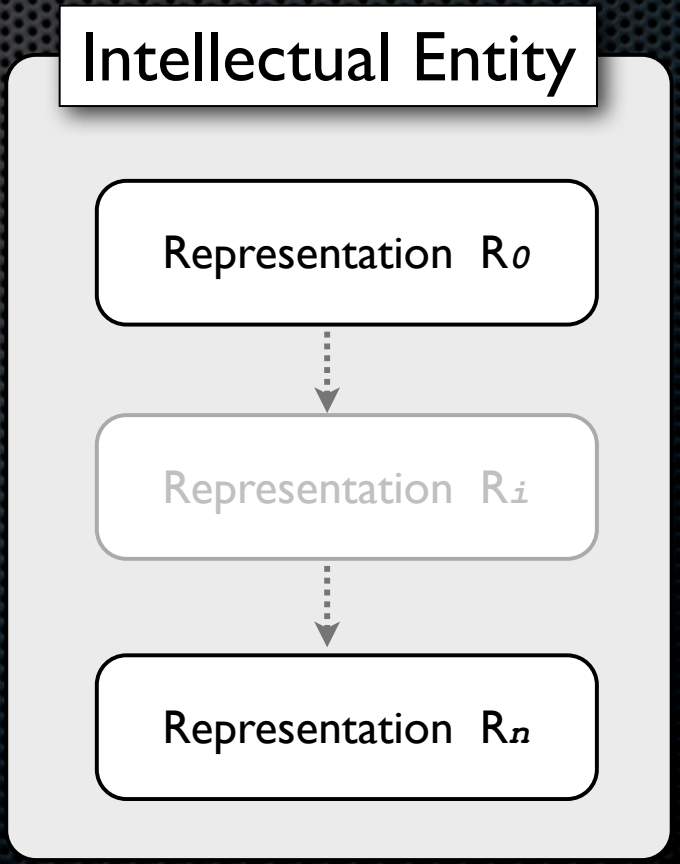
- New York University Libraries (**NYU**)
  - runs a **DSpace**-based repository
  - **Team**: Dr. Michael Stoller, Joseph Pawletko, Rasan Rasch



TIPR
AIP Structures
FCLA

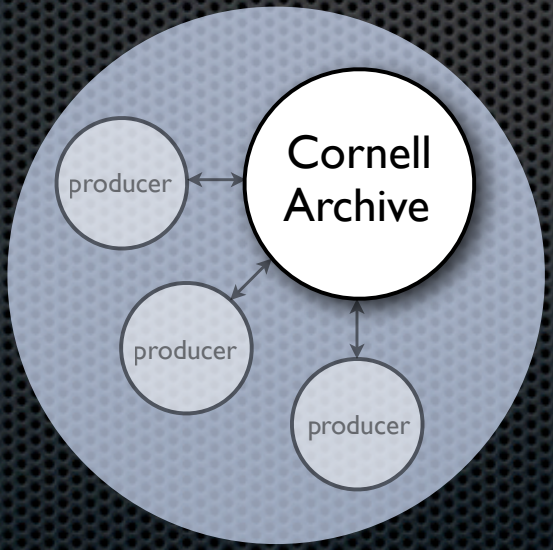


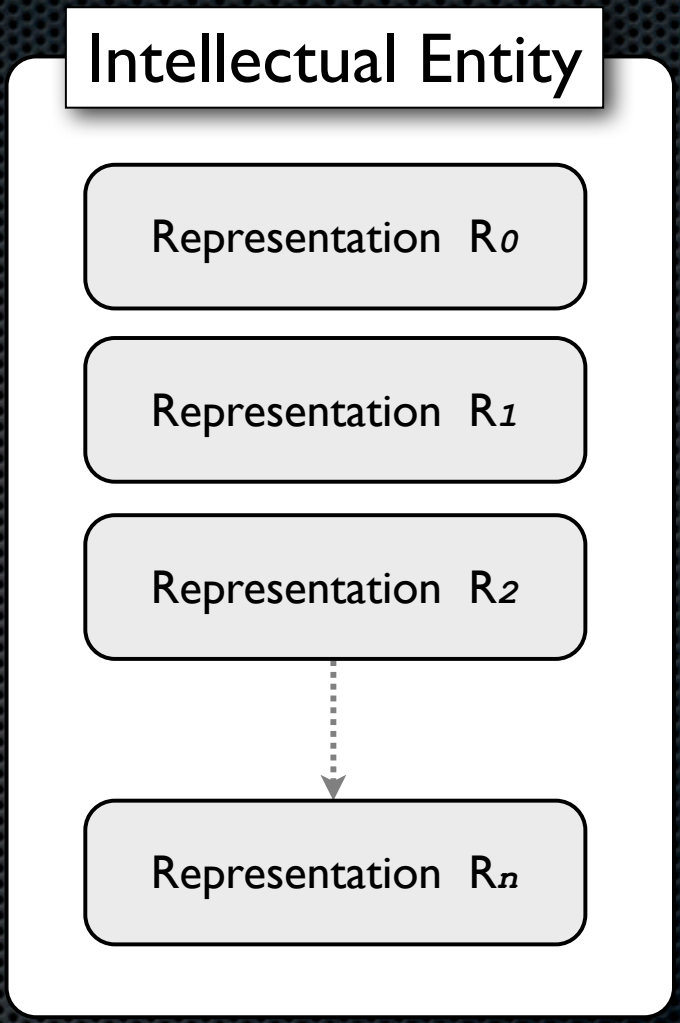
- One AIP per Intellectual Entity
- Retain First and Latest Representations
- Discard Intermediate Representations



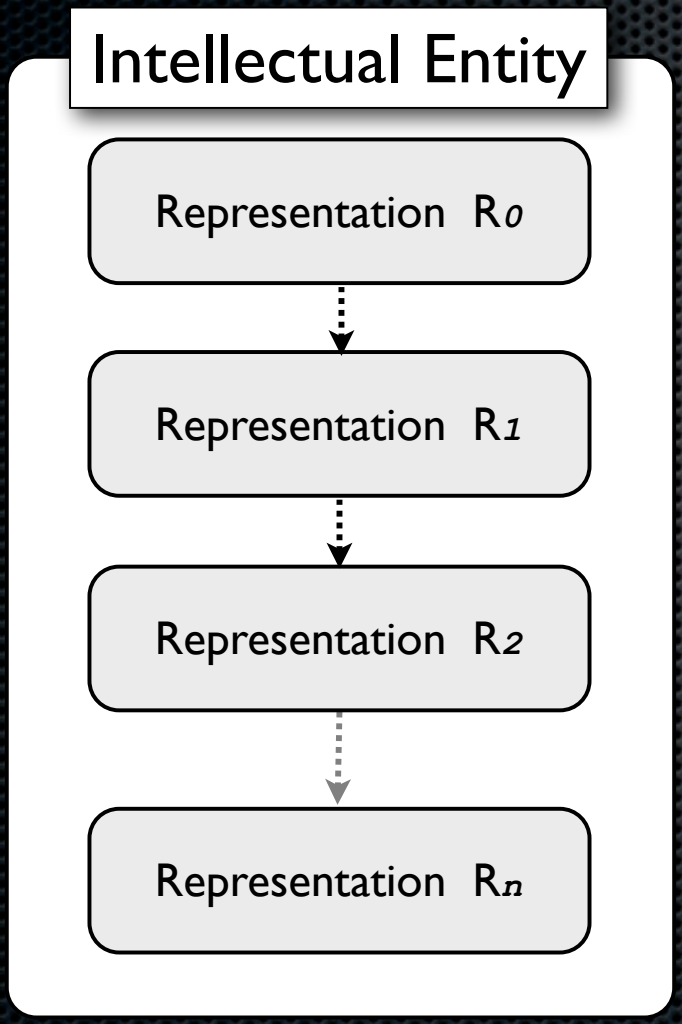
TIPR
AIP Structures
CUL

- One AIP per Representation
- Retain All Representation AIPs (including "intermediates")

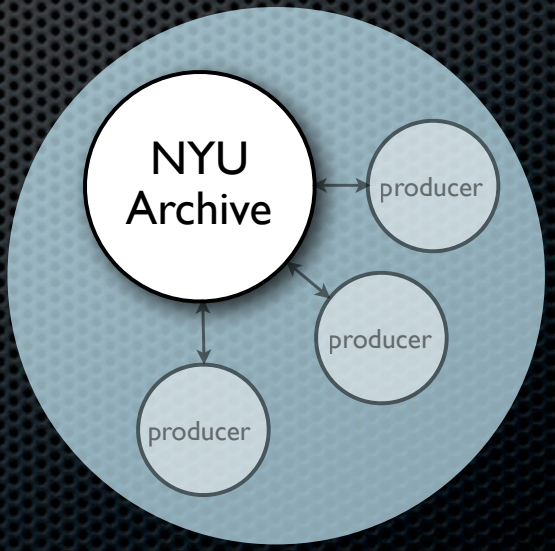




TIPR
AIP Structures
NYU



- One AIP per Intellectual Entity
- Retain all Representations (including "intermediates")



Repository / AIP Heterogeneity:

	FCLA	CUL	NYU
Repository Implementation	DAITSS	aDORe -> Fedora	DSpace-based
# of AIPs per **n** representations	1	n	1
retain intermediate representations?	no	yes	yes

Repository Exchange Package (RXP)

- RXP design goals:
  - use standards familiar to Preservation community:
    - METS and PREMIS
  - be able to accommodate different AIP structures
  - contain sufficient data for receiving repository at:
    - RXP level
    - Representation level
  - identify data that receiving repository must understand

RXP: Minimal Structure

```
./rxp.xml
```

```
./rxp-digiprov.xml
```

```
./rxp-rep-1.xml
```

```
./rxp-rep-1-digiprov.xml
```

```
./files/
```

RXP: Minimal Structure

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RXP-level information

RXP: Minimal Structure

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./rxp-digiprov.xml
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./rxp-rep-1.xml
```

```
./rxp-rep-1-digiprov.xml
```

```
./files/
```

Representation-level information

RXP: Minimal Structure

```
./rxp.xml
./rxp-digiprov.xml
./rxp-rep-1.xml
./rxp-rep-1-digiprov.xml
./files/
```

METS document containing Source Repository info. References RXP provenance, (optional) rights, and represenations

RXP: Minimal Structure

```
./rxp.xml
./rxp-digiprov.xml
./rxp-rep-1.xml
./rxp-rep-1-digiprov.xml
./files/
```

PREMIS document containing RXP-level digital provenance

RXP: Minimal Structure

```
./rxp.xml
./rxp-digiprov.xml
./rxp-rep-1.xml
./rxp-rep-1-digiprov.xml
./files/
```

METS document describing representation 1

RXP: Minimal Structure

```
./rxp.xml
./rxp-digiprov.xml
./rxp-rep-1.xml
./rxp-rep-1-digiprov.xml
./files/
```

PREMIS document containing representation 1 digital provenance

RXP: Minimal Structure

```
./rxp.xml
./rxp-digiprov.xml
./rxp-rep-1.xml
./rxp-rep-1-digiprov.xml
./files/
```

directory containing the representation files

RXP: Optional Files

`./rxp-rights.xml`

PREMIS document containing RXP-level rights information

`./rxp.xml.sig`

a stand-alone digital signature in OpenPGP format generated using sender's private key, and `rxp.xml`

RXP: Optional Files

`./rxp-rep-2.xml`

`./rxp-rep-2-digiprov.xml`

⋮

`./rxp-rep-n.xml`

`./rxp-rep-n-digiprov.xml`

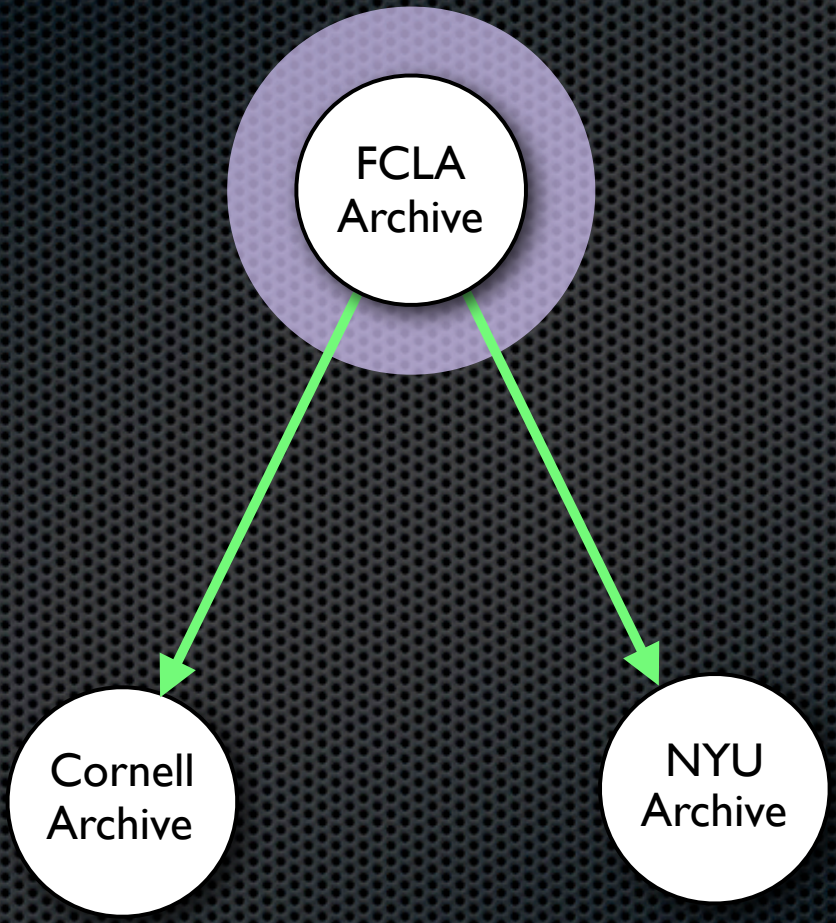
information for additional Representations

Each `rxp-rep-n.xml` must be accompanied by a corresponding `rxp-rep-n-digiprov.xml`.

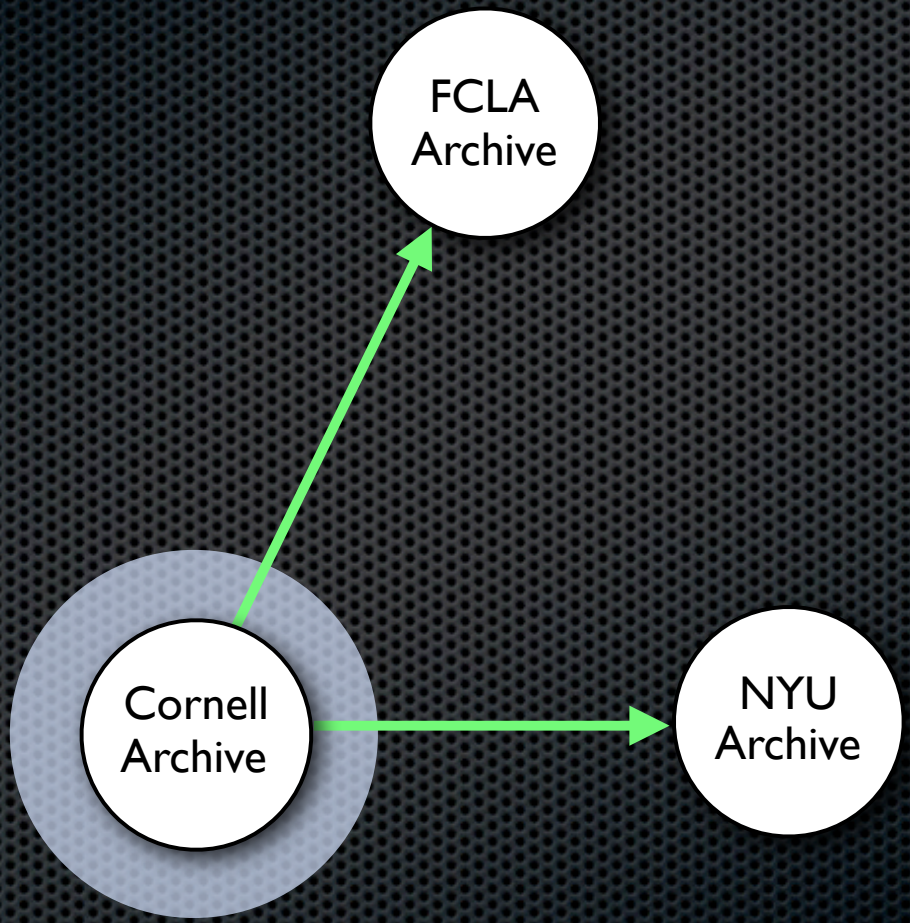
Transfer Tests

- Two different transfer scenarios
  - Broadcast Transfer
  - Ring Transfer
- Analyzing test results against expectations
  - using results to improve RXP structure

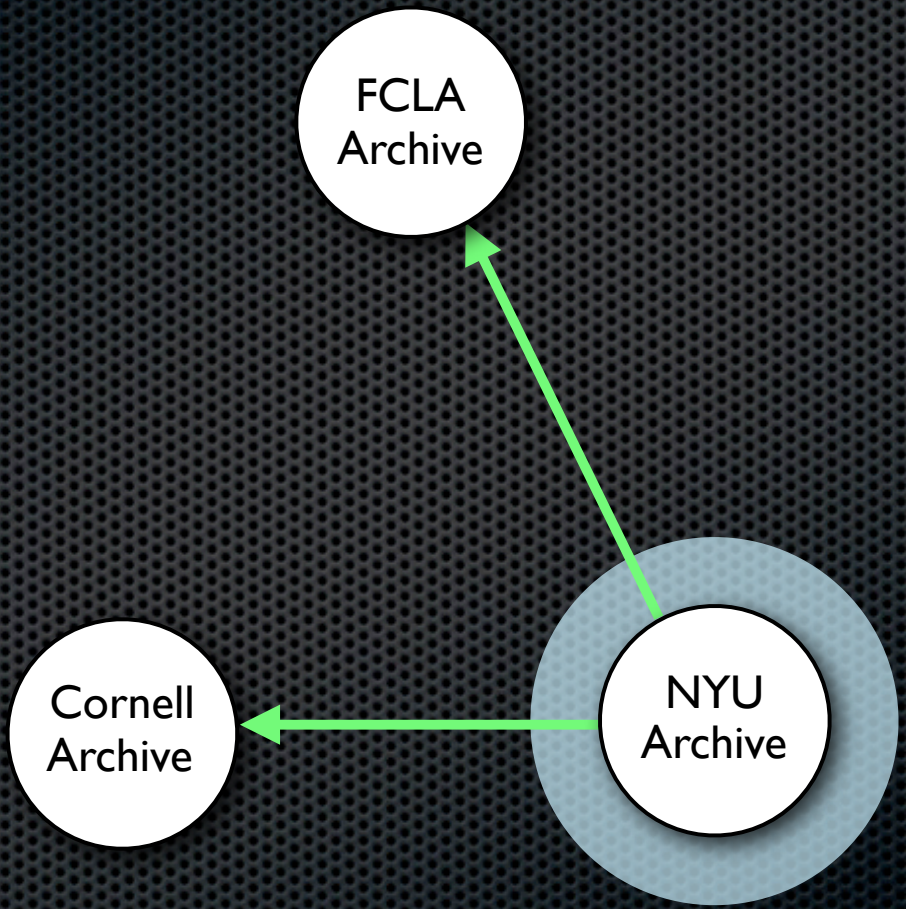
TIPR Testing: Broadcast Transfer



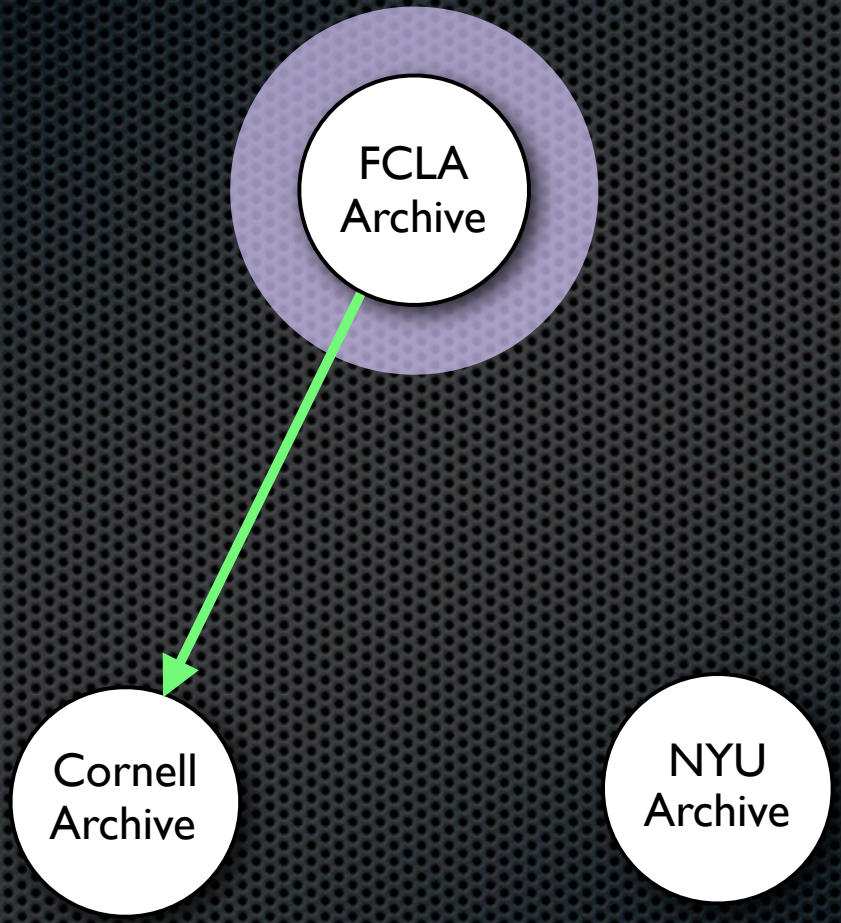
TIPR Testing: Broadcast Transfer



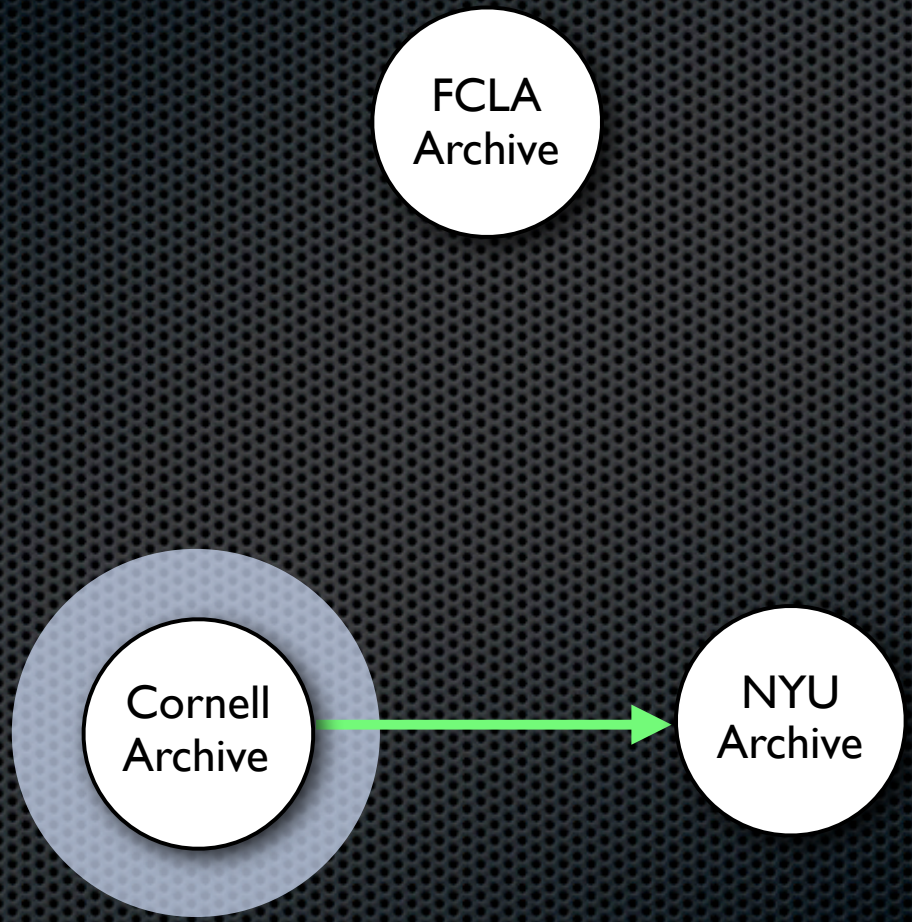
TIPR Testing: Broadcast Transfer



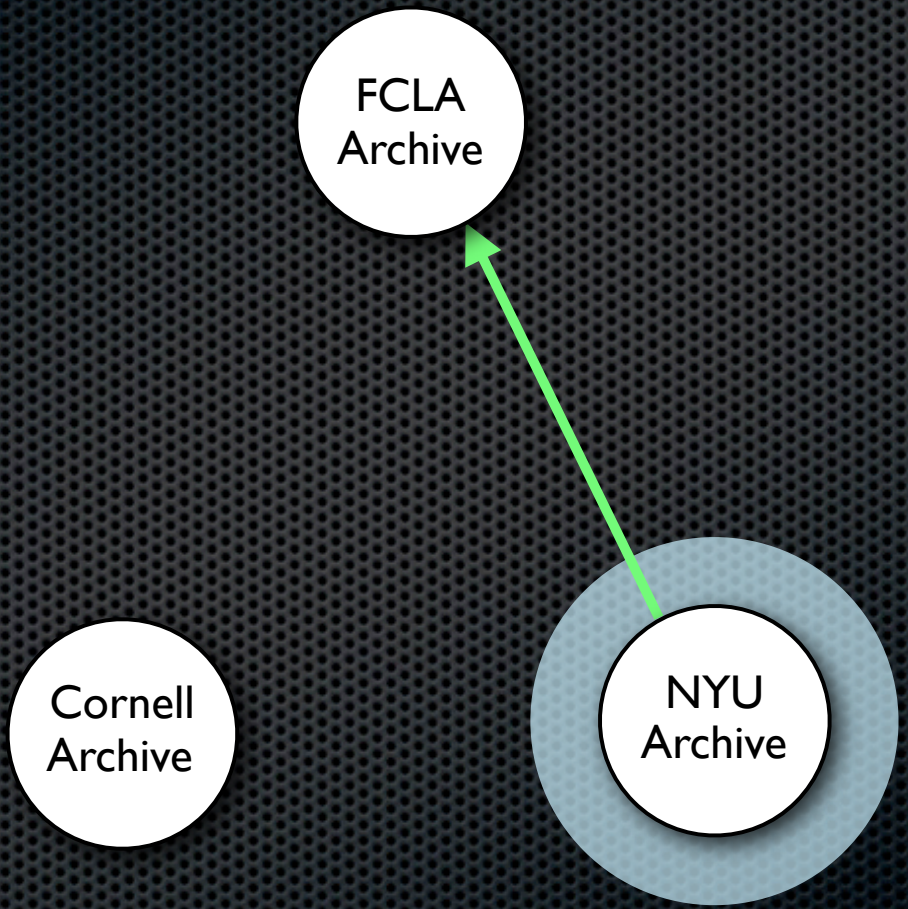
TIPR Testing: Ring Transfer



TIPR Testing: Ring Transfer



TIPR Testing: Ring Transfer



Issues:

- PREMIS:
  - Repositories need rights and digiprov at RXP-level
  - Highest unit of description in PREMIS is `representation`
  - RXP can contain multiple representations
  - RXP more like an Intellectual Entity
  - Asked PREMIS Editorial Committee to consider allowing PREMIS elements to describe Intellectual Entities when applicable
  - TIPR project still using PREMIS for RXPs

Issues:

- Identified need for Inter-repository Service Agreements (SA):
  - SA documents inter-repository relationship:
    - RXP composition vis-à-vis optional files
    - RXP transfer logistics
    - target repository actions upon RXP receipt
    - inter-repository rights and permissions agreements
    - archiving & preservation treatment at target repository
    - financial arrangements between source and target repositories
    - legal aspects of source and target relationship

Lessons Learned to Date

- Effort required to generate RXPs is reasonable
- Ingesting foreign RXPs more difficult, but not prohibitive
- Maintaining cross-repository provenance is tricky
- Transfer format is only one part of solution
- Inter-repository agreements are important

Future Plans

- Finish grant-related work
- Continue to talk and write about TIPR
- Respond to feedback from the community on RXP spec

Acknowledgements

- TIPR is funded by a generous grant from the **Institute of Museum and Library Services (IMLS)**

TIPR Towards Interoperable Preservation Repositories

Institute of Museum and Library Services | Cornell University | NEW YORK UNIVERSITY | FCLA The Florida Center for Library Automation

Questions?

- **Thank you for your time...**

TIPR Towards Interoperable Preservation Repositories

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TIPR:

Interchange you can believe in!

http://wiki.fcla.edu:8000/tipr/

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